

Real-Time, Maneuvering Flight Noise Prediction for Rotorcraft Flight Simulations, Phase I

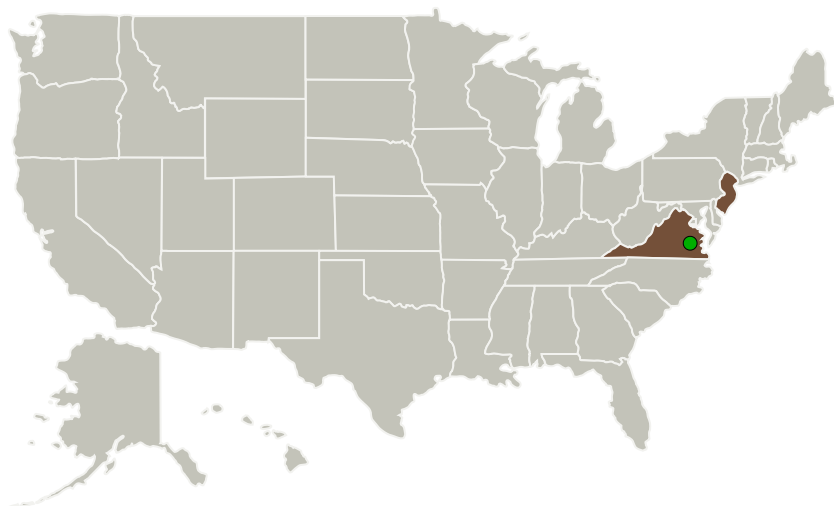
Completed Technology Project (2011 - 2011)



Project Introduction

This proposal outlines a plan for developing new technology to provide accurate real-time noise prediction for rotorcraft in steady and maneuvering flight. Main rotor and tail rotor thickness and loading noise, including Blade-Vortex Interaction noise and Tail-Rotor Interaction noise, will be predicted with physics-based methods by enhancing a real-time lifting surface/free-vortex-wake blade aerodynamics module and coupling it to maneuvering flight acoustic prediction software modified for operation in a time-marching flight simulation environment. Also included will be methods to account for spherical spreading, atmospheric absorption, and ground effect for flat level terrain. All new software will be designed with the eventual goal of supporting both high fidelity and real-time solutions through a hierarchy of methods. Phase I will provide the development of proof of concept prototype software demonstrated for both steady and maneuvering flight. Phase I will also see an evaluation of real-time potential of the various models. Phase II will provide the development of a fully-functional, noise prediction software module with real-time and high fidelity capability designed for easy coupling with flight simulation software. Phase II will also see additional enhancements in the areas of acoustic propagation, High Speed Impulsive noise, and engine and transmission noise.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Continuum Dynamics, Inc.	Lead Organization	Industry	Ewing, New Jersey
● Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia

Primary U.S. Work Locations

New Jersey	Virginia
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Project Transitions

**February 2011:** Project Start**September 2011:** Closed out**Closeout Documentation:**

- Final Summary Chart(<https://techport.nasa.gov/file/138451>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Continuum Dynamics, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

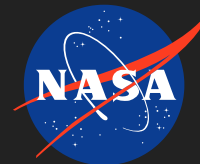
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Co-Investigator:

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Technology Maturity (TRL)

Start: **3**
Current: **4**
Estimated End: **4**



Technology Areas

Primary:

- TX15 Flight Vehicle Systems
 - └ TX15.1 Aerosciences
 - └ TX15.1.4 Aeroacoustics

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System